UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

February 15, 2008

REPLY TO THE ATTENTION OF:

SR-6J

Mr. Jerry C. Winslow
Principal Environmental Engineer
Xcel Energy
414 Nicollet Mall (Ren. Sq. 8)
Minneapolis, Minnesota 55401

RE: Comments to Draft Feasibility Study (FS)
Ashland/NSP Lakefront Superfund Site

Dear Mr. Winslow:

In accordance with the Administrative Order on Consent (AOC), CERCLA Docket No. V-W-04-C-764, Section X, Paragraph (d), the United States Environmental Protection Agency (EPA) is disapproving the draft Feasibility Study (FS). EPA has scheduled a meeting for March 3, 2008 to discuss our comments regarding the draft FS. This letter is a consolidation of EPA and WDNR comments. Northern States Power Company (NSPW), (d.b.a. Xcel Energy) will have 30 days after the March 3rd meeting to modify the submission (FS). Please submit the revised FS document based on the comments provided below by April 2, 2008.

General Comments:

1. More cohesion must be maintained between the text and the figures. In particular, the figures should show and label all of the key components of each alternative, even if existing facilities or extraction wells are used.

2. The draft as submitted was difficult to review due to the lack of detail in the descriptions, drawings and cost estimates. Detailed descriptions of options and combined options that are applicable to an area need to be included accompanied by drawings and cost estimates. As the effected areas/media of the site are connected and any remedial action in one area will have to be coordinated with actions at other areas a "whole site" view needs to be added. It is difficult to determine how actions taken in one area will impact actions taken in another area.

   As an example, many of the remedial options reviewed for soils, groundwater and sediments contain a wastewater handling component. The FS seems to minimize the extent of that wastewater handling component. The FS relies on discharge to the City of Ashland wastewater treatment plant. In light of the potential volume of water associated with pumping and treating groundwater from the Copper Falls aquifer, de-watering during soils excavation and sediment removal and de-watering and storm and surface water management, a much more thorough discussion of the wastewater

component needs to be included in the FS. It should address expected flows from a combination of actions, evaluating technologies, costs and discharge points.

3. Confined Disposal Facility (CDF): Under the National Contingency Plan, 40 C.F. R. 300.430(e), the FS must present a detailed analysis of the alternatives that represent viable approaches to remedial action. The analysis of alternatives must consider nine evaluation criteria at 40 C.F.R. 300.430(e)(9)(iii). In selecting a remedy, EPA must first consider the threshold criteria: overall protection of human health and the environment, and compliance with Applicable or Relevant and Appropriate Requirements (ARARs), 40 C.F.R. 300.430(f)(1)(i)(A). CERCLA Section 121 requires selection of a remedial action that is protective of human health and the environment. EPA's approach to determining protectiveness involves risk assessment, considering both ARARs and to-be-considered materials (TBCs). There is not enough detail in the draft FS to determine if a CDF is a protective remedial alternative and complies with ARARs at the Site. As put forth in the FS by NSPW, a CDF in Lake Superior will have to be protective and meet the stated ARARs. The NR 500 series of the Wisconsin Administrative Code is an ARAR for this alternative because a CDF which contains dredged material and solid waste is a solid waste disposal facility. Landfill location, performance, design, and construction criteria will have to be met along with all other applicable provisions of the NR 500 series Administrative Code. This is a lack of detail in the draft FS on how a CDF meets these performance, design, and location-specific ARARs.

   In addition to the threshold criteria requirements, EPA must consider the primary balancing criteria and modifying criteria in 40 C.F.R. 300.430(1)(i)(A) and (B). The primary balancing criteria include long-term effectiveness and permanence, implementability, and cost, and the modifying criteria includes the State and community acceptance. The FS does not provide enough detail to evaluate the CDF alternative under these criteria, and serious issues have been raised as to whether a CDF is a viable alternative. Wisconsin Department of Natural Resources (WDNR) has continued to outline the potential difficulties NSPW will encounter in trying to obtain the appropriate authorization of a CDF. The legal authority to create a CDF on the lakebed raises questions of implementation as well as State and community acceptance. The mechanisms to authorize a CDF appear to be a lakebed grant from the Wisconsin Legislature, a "bulkhead line" under Section 30.11, Wisconsin Statutes, by the City of Ashland, or a submerged lands lease to the City from the Board of Commissioners of Public Lands for the purposes specified in Section 24.39, Wisconsin Statutes. These mechanisms require a finding that the proposed fill is in the "public interest" or enhances a public trust purpose, and would require the cooperation of the City of Ashland. Until a CDF is authorized, this alternative may not be viable, and the FS does not present a plan to obtain such authorization. In addition, recent proposals to construct new, or expand existing CDFs in Wisconsin have been unsuccessful due to the inability to engineer a facility which can be assured to be suitable and stable for the long term and to withstand the public opposition to the facility. Many proposed CDFs fail to take into account the actual costs associated with engineering, constructing and maintaining the facility. There are also concerns

that the proposal calls for the CDF to accept on land solid waste which will create a landfill in the waters of the state.

While NSPW may evaluate the feasibility of a CDF as part of the FS, it is unclear whether this option is viable given the remedy selection criteria at 40 C.F.R. Part 300.430(f). The protectiveness of the remedy and compliance with ARARs, as described in the previous discussion and correspondence, are threshold criteria, and the long-term effectiveness and permanence, mobility, implementability, and cost are balancing criteria, and State and community acceptance are modifying criteria, all of which will impact the viability of a CDF. The FS should address all of the criteria in greater detail in order for EPA to properly evaluate the CDF alternative.

4. The soil, groundwater and sediment sections comparison of potential remedial alternatives tables should be changed to a numeric system. The use of one type of Table system for groundwater and soils and a different Table system for sediments can be confusing to the reader. NSPW drops the community acceptance and agency acceptance from the sediment table. Both community and agency acceptance are required criteria for sediments just as they are for groundwater and soils. NSPW should revise all three tables to include all criteria and assign a numeric scale for each option which is more accurate and useful rather than the "high, medium, low" that is currently being used. This table format should be carried through all sections.

5. **Soils** - Add an alternative that includes the removal of contaminated soils within the ravine south of St.Claire Street including the historic MGP structures and all areas that exhibit free product. In addition, add a Kreher Park, hot spot removal (waste tar dump/seep area and piping trace to the west) and containment for Kreher Park with groundwater control and treatment. Included in the soils section is a discussion regarding the disposal of up-land contaminated soils in Kreher Park as part of a CDF. Contaminated soils and any associated demolition debris are considered a solid waste. The management and disposal of that material will fall under the regulations of Wisconsin Administrative Code NR 500 including the landfill siting requirements.

6. **Groundwater** - As stated above, an inclusive wastewater treatment and disposal process needs to be added to the report that will include treatment of contaminated groundwater.

7. As you know residents of the Chequamegon Bay area participated in a workshop hosted by EPA and WDNR on October 25, 2007. The purpose of the workshop was to solicit from participants the characteristics of cleanup options that would make a remedy(s) most acceptable to the public. The Agencies sponsored the workshop in response to requests by area residents for opportunities to provide early input on possible remedies. EPA anticipates that the input provided by workshop participants is an early indicator of the kind of feedback that might be received during formal comment period to be held in conjunction with the release of the proposed cleanup plan. Based on the results of the workshop, (see attached Summary) EPA and WDNR have prepared a brief analysis of the alternatives presented in the draft FS.

Please include this analysis and prepare write-ups for alternatives presented in the future FS.

Alternative SED-1: No Action
SED-1 would not meet any of the characteristics of an action that would be acceptable to the community

Alternative SED-2: Consolidation, CDF, and Monitoring
Construction of a CDF (filing in 6 acres of lake bed) would fit the characteristic of less short term disruption to the area. It would limit the characteristics including; marina boat storage and use of the park area during construction, future use of the lake bed (covered), and lacks the permanence of a removal option.

Alternative SED-3: Removal, Capping, Treatment and/or Disposal, and Monitoring
Due to the vagueness of the discussion of this option in the FS it is difficult to determine where they plan on removal or capping. This option may be cheaper than options SED-2 and SED-4. Capping would limit the uses of the open water area. To protect the cap boating, swimming and wadding may be limited. Due to the potential of storms and ice damage, this option lacks permanence and might be subject to further action in the future.

Alternative SED-4: Removal, Treatment and/or Disposal, and Monitoring
Removal would meet the most characteristics. Short term it would cause about the same impacts as SED-2 and 3 and would take about the same amount of time. If designed and implemented correctly the marina operation should be able to operate during cleanup with the potential for some disruption to boat storage. Truck traffic can be limited through design. It would be the most sustainable as the wastes would be removed and could be separated for re-use during handling. This option also fits the City of Ashland Lakefront Development Plan and allows the most flexible future use of the city park, waterfront and lakebed areas.

Specific Comments:

1. **Executive Summary, Page ES-2:** The RI Report was verbally approved by EPA with changes in October 2007 not August 2007.

2. **Executive Summary, Page ES-4:** The FS states "Although removal of all wood waste and fill soils from Kreher Park may be acceptable to the Agency..." EPA has not formally commented on whether removing the material that makes up Kreher Park is acceptable or not acceptable. Please remove that statement.

3. **Executive Summary, Page ES-4:** The FS states, "Both of these technical memoranda have been approved by USEPA". That is not the case. EPA reviewed and commented on the technical memoranda and you finalized them based on our comments but we do not approve those documents. Please clarify the statement to

state that both of these documents were finalized after EPA review or something similar to that.

4. **Executive Summary, Page ES-6:** The discussion of SD-2 and SD-3 should include a more complete explanation of the difficulty in implementability (see sediment comment 13 below).

5. **Figure 2-1:** Where is Lake Shore Drive on the site features figure? Where is the gravel-covered parking area? This figure should show and label the major features discussed in Section 1.1 of the report for those who are not familiar with the site. For example, it is not clear where all of the NSPW property components are located. Also, label the buildings in red to the north of the "approximate location of the former coal tar dump" as the city WWTP – it is not clear on the figure.

   In addition, all of the major symbols and line types should be defined in the legend, including the monitoring wells (if known, who installed them and when?) and the red lines showing the structures (presumably, the red lines are for all structure types and not just for NSPW). Are the structures shown in red existing or include historic features? Using a different color of line type or line weight might be helpful in showing the NSPW structures vs. the non-NSPW structures. Other line types, shaded areas, and symbols are also not defined in the legend.

   Is the "approximate location of former solid waste disposal area" also part of the filled ravine? The line types used are very similar, as well as the "approximate location of former open sewer" and "NPL site boundary."

   Show the "former seep area" on the figures, as described in Section 3.1? Where is the NSPW service center, as mentioned at the end of Section 3.1.2?

6. **Section 3.1, Page 3-1, Summary of RI Findings:** Some additional lead-in description of the site geology would be helpful prior to mentioning the "Copper Falls Aquifer," or at least a reference to a later section where it is described.

7. **Section 3.1.1, Page 3-3, Summary of RI Findings:** Delete last sentence "*This document presents the ..... the Remedial investigation Report.*"

8. **Section 3.1.2, page 3-3, Site Setting:** Include potentiometric maps and geologic cross-sections in this section. FS is supposed to be stand alone document.

9. **Section 3.1.3, Page 3-4, Nature and Extent of Contamination:** It is stated that, "*a low flow pumping system currently extracts NAPL from deep .....*"

   Modify this sentence to state, "a low flow pumping system currently extracts NAPL consisting of 90 percent water and 10 percent product from deep ....."

10. **Section 3.1.3, Page 3-4, Nature and Extent of Contamination:** Add in here that NAPL is also present in the form of a sheen throughout the Kreher Park.

11. **Section 3.1.3, Pages 3-4 – 3-7, Nature and Extent of Contamination:** Provide a figure showing the locations where NAPL has been measured or observed.

12. **Section 3.1.3, Pages 3-4 and 3-5, Nature and Extent of Contamination:** It is stated that NAPL is located in isolated areas in the Kreher Park.

    This statement is incorrect because the NAPL sheen was detected in most of the test pits throughout Kreher Park. Modify the statement appropriately.

13. **Section 3.1.3, Pages 3-4 and 3-5, Nature and Extent of Contamination:** It is stated that *in both areas, NAPL remains in the underlying wood waste layer, which underlies the entire Park. Although the lateral extent of the NAPL zone is limited, contaminated soil and groundwater conditions are widespread across the entire Park area.*

    Since the NAPL is present in the wood waste layer throughout the Park, the lateral extent of NAPL cannot be considered a limited zone. Modify the statement appropriately.

14. **Section 3.1.3, Page 3-7, Nature and Extent of Contamination:** Is the NSPW service center the same as the NSPW garage shown on the figures?

15. **Section 3.1.3, Pages 3-7 and 3-10, Nature and Extent of Contamination:** It is unclear how much NAPL has been removed by the extraction system. According to page 3-7:

    Since 2000, NSPW has maintained a NAPL recovery system consisting of three extraction wells which have removed over 9,000 gallons of NAPL/water emulsification (approximately 10% oil/tar and 90% water) and over a million gallons of contaminated ground water from the aquifer.
    However, according to page 3-10:

    > *The NAPL removal system has removed a fraction (more than 8,300 gallons of product) of the NAPL and dissolved plume mass.*

    These amounts are not consistent. The first quote seems to indicate that 9,000 gallons of NAPL/water emulsification was removed, which was 10% oil/tar, so that approximately 900 gallons of NAPL would have been removed. However, the second quote states that 8,300 gallons of product was removed. Please clarify.

16. **Section 3.1.3, page 3-11, Nature and Extent of Contamination:** According to page 3-11: *Since operations at the WWTP were relocated in 1992, no significant contaminant contribution action has occurred.*

Where were WWTP operations relocated from/to in 1992? Label the former/existing WWTP on the figures.

17. **Section 3.1.3, Page 3-7, Nature and Extent of Contamination - Copper Falls Aquifer:** It has not been demonstrated in the RI that hydrogeologic conditions at the site have restricted the migration of contaminants in the Copper Falls Aquifer. Also, references are made to a "stagnation zone" in the Copper Falls aquifer. Based on available information the existence of stagnation zone has not been established. Remove reference to a "stagnation zone."

18. **Section 3.1.3, Page 3-7, Nature and Extent of Contamination - Copper Falls Aquifer:** Last sentence should read; "Additional wells (plural) are needed to ensure that contaminants are not migrating beyond the shoreline in the Copper Falls Aquifer.

19. **Section 3.1.4.2, Page 3-10, *Contaminant Source and Disposition*:** *It is stated* NAPL removal system has removed a fraction (more than 8,300 gallons of product). The volume of product removed is much smaller than specified herein. Modify this paragraph appropriately.

20. **Section 3.1.4.3, Page 3-11 Summary:** Last two sentences should read (additions are in bold); "Additionally, the high levels of PAHs in the soil at Kreher Park compared to the upper bluff **suggest the possibility** of a source at the Lakefront not exclusively caused by MGP wastes. These other potential sources include **spills during** rail car off loading of fuel feed stocks and raw materials to support industrial activity, primarily **MGP activity**."

21. **Section 3.3, Pages 3-14 and 3-15, Table 3-1:** The volume and areal extent of sediment contamination is based on a rounded value of 10 ppm dry weight, rather than the RAO of 9.5 ppm dry weight. The use of a rounded value may result in an underestimate of volumes, and underestimate of costs. The impacts of this rounding on volumes and costs should be discussed.

22. **Section 3.3.1, Page 3-16, Soil:** In this section several areas that focus on the removal of soil based on highest contamination are described. However, the basis for selection and determination of extent of removal for these areas has not been provided. Provide a basis for selecting the areas for removal; determining extent of removal for each area; and demonstrate that this approach will be protective of human health and the environment. Provide a Figure depicting each area.

23. **Section 3.3.1, Page 3-16, Soil:** It is stated herein that potential remedial alternatives focused on the removal of areas with the highest level of contamination. Provide a rationale for focusing remedial alternatives for areas with the highest level of contamination; and demonstrate that such approach will mitigate risks identified at the site.

24. **Section 3.3.1, Page 3-16, Soil**: What was the rationale for selecting the NR 720 WAC benzene RCL to define the extent of soil contamination? A brief explanation would be useful.

25. **Section 3.3.2, Page 3-17, Groundwater:** What was the rationale for selecting the NR 140 WAC benzene Enforcement Standard exceedances to define the extent of groundwater contamination? See previous comment. Also, a note on the corresponding figure would be helpful, or in the legend.

26. **Section 3.3.3, Page 3-17, Sediment:** The preliminary remedial goal for sediment is a PAH concentration of 9.5 ppm dry weight. However, the sediment volume has been calculated using a PAH concentration of 10 ppm dry weight. This will result in underestimation of volume of sediment removal/treatment/disposal. This will also result in under estimation of costs.

27. **Table 3-1, Volumes and Areal Extent of Contaminated Media:** It would be helpful to show the soil contamination sub-areas listed in this table on the corresponding figure for reference.

28. **Figure 3-1:** How is the extent of "soil contamination" defined on this figure? Is it where any contaminants are detected in soil, where NAPL is observed, where soil concentrations exceed applicable criteria, or other? Was it based on the NR 720 WAC benzene RCL exceedances? Add an explanation to the legend or as a note.

29. **Figure 3-2:** See previous comment, as applies to extent of "groundwater contamination." In addition, clarify that "Copper Falls" refers to the deep aquifer.

30. **Figure 3-3:** Again, how was extent of contamination defined on this figure? Presumably, it is based on exceedances of the PRG for sediment of 9.5 µg PAH /g, but it is difficult to tell on the figure. Or is it greater than 10 ppm? Also, see general figure comments.

31. **Section 4.2, Pages 4-1 and 4-2, SITE Program Demonstration:** A brief general description summary of the SITE ISCO demonstration is provided but the data and the report is not included in the FS. This technology has been retained for further evaluations in the FS; therefore, the full DCI/DTI Report should be included as an Appendix to the FS.

32. **Section 4.2, Pages 4-2 and 4-3, Cap Flux Testing:** The report provides a general description summary only of the cap flux testing that took place. No data from this test is provided in the report. Without the test data it is impossible to evaluate the results and conclusions reached that are reported here. Provide the report as an appendix to the FS.

33. **Section 4.2, Pages 4-2 and 4-3, Cap Flux Testing:** The summary provided in this section suggests that low levels of water soluble constituents were able to pass

through the cap. The summary does not include information if these concentrations are protective of human health and the environment.

34. **Section 4.2, Pages 4-2 and 4-3, Cap Flux Testing:** The summary states that NAPL was not observed in the glass wool. Was NAPL observed in the cap? The information such as start date of the test is not provided. Based on the information presented in this section the bench scale suggested that there was no break through of NAPL from the cap, however, this information does not guarantee that NAPL will not break through the cap during the life of the cap or long term monitoring program.

35. **Section 4.3, Pages 4-4, Bench Scale Air Emissions Testing:** The report provides a brief summary of the bench scale air emissions testing that took place. No data from this test is provided in the report. Without the test data it is impossible to evaluate the results and conclusions reached in this summary that are reported here. Provide a copy of the report as an appendix to the FS.

36. **Section 4.3, Pages 4-4, Bench Scale Air Emissions Testing:** Air dispersion modeling was conducted using the EPA AERMOD model. No information was provided about assumptions and values used for running the model under the various scenarios. No output from the model is provided for the scenarios. Provide all assumptions, input and output data for each of the scenarios reported in this section. This information could be included as an appendix to FS.

37. **Section 4.3, Pages 4-4, Bench Scale Air Emissions Testing:** This section makes the assertion that several of the scenarios modeled indicated that heath risk levels (or standards) would be exceeded for receptors outside of the work area. The summary did not provide the resultant atmospheric concentrations of the COCs output by the model. Further, it did not report which health risk levels were being used for comparison. Provide the model output COC concentrations and the health risk levels that are referenced here in the text.

38. **Section 4.3, page 4-4, Bench Scale Air Emissions Testing:** This section references Areas 1, 2, 2A, and 4 but the location of the area is not provided. Provide a figure showing locations of these areas.

39. **Section 4.4, Pages 4-5 and 4-6, Multiphase Flow and Consolidation Testing:** This section provides a brief summary of the testing. Include the testing report as an appendix to the FS.

40. **Section 6.1, page 6-1, Remedial Action Objections for Soil:** The title of this sub-section should be "Remedial Action Objectives for Soil".

41. **Section 6.1, page 6-1, Remedial Action Objections for Soil:** For the 3rd bullet, define an "unacceptable risk" to ecological receptors.

42. **Section 6.1, page 6-1, Remedial Action Objections for Soil:** In the 4th bullet add sediments.

43. **Section 6.1, page 6-1, Remedial Action Objections for Soil:** Revise the 5th bullet as "Protect the environment by minimizing/eliminating the migration of contaminants in the soil to groundwater". Add another bullet stating, "Protect the environment by eliminating migration of contaminants to surrounding sediments and surface water bodies".

44. **Section 6.2.2, Page 6-2, Table 6-2:** For engineering surface barrier NR 500 Clay Cap should be retained, because the existing soil cover cannot be considered as engineered barrier.

45. **Section 6.3.2, Page 6-4, Alternative S-2 – Containment Using Engineered Surface Barriers:** Provide a figure(s) showing the existing surface barriers and proposed barriers.

46. **Section 6.3.2, Pages 6-4 and 6-5, Alternative S-2– Containment Using Engineered Surface Barriers:** Existing fill soils may prevent direct contact with the COCs, however, it has not been demonstrated that it meets the requirements of an engineered barrier, such as reduction of infiltration of precipitation or that it is of required uniform thickness across the site to qualify as an engineered barrier in terms of the direct contact pathway. To reduce infiltration an engineered barrier is necessary at the remainder of Kreher Park.

47. **Section 6.3.2, Page 6-4, Alternative S-2– Containment Using Engineered Surface Barriers:** The existing water treatment plant is in need of repair and cannot be qualified as an engineered barrier without significant repairs. Existing pavement and buildings will require upgrading by patching of holes and sealing of joints and cracks, foundation penetrations, and pavement penetrations to meet the requirements of an engineered barrier.

48. **Section 6.3.3, Page 6-5, Alternative S-3A – Limited Removal and Off-site Disposal:** Describe how the extent of removal described in this section and Figure 6-1 was determined.

49. **Section 6.3.3, Figure 6-1:** Show north direction for Figure 6-1.

50. **Section 6.3.3, Page 6-5, Alternative S-3A – Limited Removal and Off-site Disposal:** It is stated that in the upper bluff area the removal will be required in two areas. The areas are south and north of St. Claire Street. In the Figure the extent of removal is only shown for the gas holder area. Modify the figure to show both removal areas.

51. **Section 6.3.3, Page, 6-6, Alternative S-3A – Limited Removal and Off-site Disposal:** Clarify if the capacity referenced in Item Number 10 is for the existing landfill.

52. **Section 6.3.3, Page, 6-6, Alternative S-3A – Limited Removal and Off-site Disposal:** *In Item Number 10 it is stated that a NR 500 landfill may by sited on property owned or purchased by NSPW.* The siting of a NR 500 landfill will be difficult, time consuming and may have significant resistance from the public and will have to go through a complex permitting process with the regulatory agencies.

53. **Section 6.3.3, Page, 6-8, Alternative S-3B – Unlimited Removal and Off-site Disposal:** *In Item Number 9 it is stated that a NR 500 landfill may by sited on property owned or purchased by NSPW.* The siting of NR 500 landfill will be difficult, time consuming and may have significant resistance from the public and will have to go through a complex permitting process with the regulatory agencies.

54. **Section 6.3.3, Page, 6-7, Alternative S-3B – Unlimited Removal and Off-site Disposal:** *In Item Number 2 it is stated that wood waste layer will be removed, salvaged and used to backfill the excavated former ravine at the upper bluff area.* The wood chip layer is not expected to be free of contamination and therefore, would not be useful as a backfill material as suggested.

55. **Section 6.3.3, Alternatives S-3A and S-3B:** An additional key element of the conceptual design will be on the planned final end use of Kreher Park. Include the final end use of the park as a key element of the conceptual design.

56. **Section 6.3.3, Page 6-7, Alternative S-3B – Unlimited Removal and Off-site Disposal:** Aside from the volumes, what are the estimated excavation depths in the upper bluff area and Kreher Park? What about the estimated depth and length required for the sheet pile? Showing the proposed sheet pile location on a figure would be useful.

57. **Section 6.3.4, Page 6-9, Alternative S-4 – Removal and On-site Disposal:** A figure for this alternative showing the plan location of the on-site landfill as well as a section view would be helpful, as well as proposed excavations. Cap/liner details as well as the proposed dewatering system would also be useful.

58. **Section 6.3.4, Page 6-9, Alternative S-4 – Removal and On-site Disposal:** How much residual soil and groundwater contamination exceeding RAOs will be left in place and what will be excavated? Where in Kreher Park will the on-site Disposal Cell be located and how will it be situated? Will it be constructed below grade, and if so, how will the on-site landfill be adequately dewatered considering its location near the bay? Will there be a leachate collection and treatment system for the disposal cell? Will the disposal cell have a liner?

59. **Section 6.3.4, Page 6-9, Alternative S-4 – Removal and On-site Disposal:** Alternative S-4 will require building of a landfill in Kreher Park. It is highly unlikely that this can be done in compliance with Wisconsin NR500. Explain how S-4 will meet ARARs in NR500.

60. **Section 6.3, Thermal Treatment:** In-situ thermal treatment using Electrical Resistance Heating (ERH) was retained for the soil technologies and also considered for Alternative GW-7. Why was an alternative for in-situ thermal treatment for soil using ERH not considered?

61. **Section 6.3.5, Page 6-11 Alternative S-5A, -- Limited Removal and On-site Thermal Treatment:** Define the "highest level of contamination" mentioned in this section.

62. **Section 6.3.5, Page 6-11, Alternative S-5A– Ex-Situ Thermal Treatment:** Is the energy input necessary to dry the saturated soils during treatment considered?

63. **Section 6.3.5, Page 6-11 Alternative S-5A, -- Limited Removal and On-site Thermal Treatment:** Discharge to the sanitary will need permits and the discharge will have to meet the pretreatment requirements of the sanitary sewer system.

64. **Section 6.3.5, Page 6-12 Alternative S-5B, -- Limited Removal and Off-site Thermal Treatment:** Define the "highest level of contamination" mentioned in this section.

65. **Section 6.3.5, Page 6-13 Alternative S-5B, -- Limited Removal and Off-site Thermal Treatment:** Discharge to the sanitary will need permits and the discharge will have to meet the pretreatment requirements of the sanitary sewer system.

66. **Section 6.3.6, Page 6-14 Alternative S-5B, -- Limited Removal and On-site Soil Washing:** Define the "highest level of contamination" mentioned in this section.

67. **Section 6.3.6, Page 6-15 Alternative S-6, -- Limited Removal and On-site Soil Washing:** Discharge to the sanitary will need permits and the discharge will have to meet the pretreatment requirements of the sanitary sewer system.

68. **Table 6-3:** Other Remedial Technologies Used has not been described for each alternative in the narrative for each alternative. Provide a description how each remedial technology has been integrated into each alternative.

69. **Section 6.4.1, Page 6-18:** *It is stated that reduction in mass, toxicity, or mobility of contaminants, will result in the overall protection of human health and environment.* This is misleading since a soil alternative with limited removal will not be protective of human health and environment by itself. The high level of PAH contaminated areas and NAPL through out the Kreher Park will not have been addressed by these alternatives; and risks will still remain at the site. Each alternative on its own will not address all risks at the site because the remaining contaminants will continue to leach into the groundwater and possibly migrate into the bay. However, a combination of soil and groundwater alternatives for Kreher Park and Upper Bluff could be protective of human health and environment.

70. **Section 6.4.1, Page 6-18:** *It is stated that the remaining potential remedial alternatives for soil will achieve compliance with ARARs.* For Alternative S-4 construction of disposal cell on Kreher Park may not meet the requirement of siting the landfill.

71. **Section 6.4.1, Page 6-18:** *It is stated that the remaining potential remedial alternatives for soil will achieve compliance with ARARs.* Since the high level of PAH contaminated areas and presence of NAPL through out the Kreher Park will not have been addressed by all remaining alternatives, therefore, the remaining contamination in the Kreher Park will continue to leach into the groundwater and possibly migrate into the bay. However, a combination of soil and groundwater alternatives for Kreher Park and Upper Bluff may meet the ARARs.

72. **Table 6-4, Alternative S-2:** *It is stated that surface barriers will also reduce infiltration and minimize leaching to groundwater.* In Kreher Park the fill material that is proposed to be an engineered barrier was never designed and constructed as an engineered barrier. Existing fill soils may prevent direct contact with the COCs, however, it has not been demonstrated that it meets the requirements of an engineered barrier, such as reduction of infiltration of precipitation or that it is of required uniform thickness across the site to qualify as an engineered barrier in terms of the direct contact pathway. The fill is not of low permeability soil and was not compacted to achieve low permeability. Therefore, the existing fill cover cannot be considered to be an engineered barrier for the Kreher Park to reduce infiltration. This alternative on its own will not address risks at the site because the contaminants will continue to leach into the groundwater and possibly migrate into the bay.

73. **Table 6-4, Alternative S-3A:** Since the high level PAH contaminated areas and the presence of NAPL through out Kreher Park are not addressed in this alternative the risk at the site will remain. Also, the comment for an engineered barrier and infiltration mentioned above for Alternative S-2 apply to this comment (see Comment 72). This alternative on its own will not address all risks at the site because the remaining contaminants will continue to leach into the groundwater and possibly migrate into the bay. This comment also applies to Alternatives S-4. S-5A, S-5B and S-6.

74. **Table 6-5, Alternative S-2:** *It is stated that the surface barrier will reduce infiltration and minimize mobility of contaminants leaching to groundwater.* Existing fill soil at Kreher Park has not been demonstrated to meet the requirements of an engineered barrier. The fill soil at the Kreher Park does not comprise low permeability soil; the quality of the fill was not checked prior to placement; the fill was not place with required uniform thickness across the site; the fill was not compacted in lifts during its placement, there was no QA/QC performed during placement of the fill; and the intent of filling the Kreher Park was not to provide an engineered barrier but to reclaim land. Therefore, the fill placed at Kreher Park cannot be considered to be engineered barrier that help to reduce infiltration or reduce mobility of contaminants leaching to groundwater.

75. **Table 6-5, Alternative S-3A:** *It is stated that the reduction of toxicity, mobility and volume reduction is expected to be high.* Since high levels PAH contaminated areas and the presence of NAPL through out the Kreher Park has not been addressed in this alternative the reduction in toxicity, mobility and volume reduction is expected to be low. This alternative on its own will not achieve reduction in toxicity, mobility and volume reduction. This comment also applies to Alternatives S-4. S-5A, S-5B and S-6.

76. **Table 6-5, All Alternatives (except S-1 and S-3B):** For these alternatives besides residual contamination mentioned, high level PAH contaminated areas and presence of NAPL throughout the Kreher Park will not be addressed. This should be mentioned in the type and quantity of residuals remaining.

77. **Table 6-6, Alternative S-2**: Same as Comment 74 above.

78. **Table 6-6, Alternative S-3A:** *It is stated that significant contaminant mass will be removed from highly contaminated areas where NAPL is present. Residual contamination may remain at the site.* Since high level of PAH contaminated areas and the presence of NAPL through out the Kreher Park has not been addressed in this alternative it is inappropriate to state that residual contamination will remain on site. This comment also applies to Alternatives S-4. S-5A, S-5B and S-6.

79. **Table 6-6, Alternative S-3A:** *It is stated that post remediation monitoring for residual contamination remaining on site may be needed to ensure compliance with RAOs.* Same as Comment 78 above.

80. **Table 6-6, All Alternative (except S-1):** *For protection of community and site worker during remediation it is stated that actions to protect community and site workers during remediation can be implemented.* Provide a general description such as actions to protect community and site worker. The chemical risks the community and worker face, how long the risk will exist for the community or worker, the impact of vehicular traffic risks, and other factors are not discussed. Also, what are the ways to mitigate such risks are not discussed. Provide alternative specific information.

81. **Table 6-6:** Limited Removal and Off-site Incineration is Alternative S-5B and not S-5A.

82. **Table 6-7, Alternative S-2:** *It is stated for the surface barrier that it is a reliable technology for elimination of direct contact exposure route and reduction of infiltration.* An engineering barrier is a reliable technology to reduce infiltration if the barrier is designed to use appropriate low permeable material, it is compacted in lifts (except for plastic liners and fabrics), it is designed such that it promotes appropriate surface water drainage, appropriate QA/QC is followed during construction etc. None of this was done for either the asphalt in the upper bluff or the fill in the Kreher Park.

83. **Table 6-7, Alternatives S-3A and S-3B:** *For Administrative Feasibility it is stated that Regulatory approval likely, selection of landfill for off-site disposal would be required.* Getting regulatory approval of an off-site landfill is probably difficult. If the landfill is located near the Great Lakes it would likely be even more difficult to obtain regulatory approval.

84. **Table 6-7, Alternatives S-4:** *For Administrative Feasibility it is stated that Regulatory approval likely, would require siting and construction of disposal cell for on-site disposal.* Getting regulatory approval of a disposal cell is probably difficult. Since the disposal cell is located near the Great Lakes it probably would make it difficult to obtain regulatory approval.

85. **Table 6-8, Alternative S-3B:** Mobilization costs for alternative S3-B appears to be high. Provide a breakdown and justification of the high mobilization cost estimate.

86. **Table 6-8, Alternative S-3B:** The cost estimate does not appear to include restoration of Kreher Park to its original condition. The public would expect that the Park be returned to its original use as a park. Include an estimate for restoration of the park to original condition in addition to the estimate given for wetlands restoration.

87. **Table 6-9:** Modify this table based on Comments 83 - 86.

88. **Table 6-9, Comparison of Potential Soil Remedial Alternatives:** Given that "the evaluation of short-term effectiveness is based on the degree of protectiveness of human health achieved during construction and implementation of the remedy," the short-term effectiveness for alternatives including excavation would probably be somewhat lower than for those alternatives where no excavation occurs, due to the potential exposure of the community and construction workers to contaminants during excavation.

89. **Section 6.5.1, Page 6-37 through 6-40:** The header provided for pages is incorrect. It should read "Remedial Alternatives for Groundwater".

90. **Section 6.5.1, Page 6-37:** It can be inferred from the discussion that the unlimited removal alternative and limited removal alternatives will provide the same level of overall protection of human health and environment. This is not correct because significant contamination will still remain for the limited removal alternative.

91. **Section 6.5.2, Page 6-37:** *It is stated that if properly implemented, the remaining remedial responses could achieve compliance with ARARs and TBCs for soil.* The other alternatives inferred in here are all limited removal alternatives. For limited removal alternatives, areas of high PAH contamination and NAPL throughout Kreher Park will still remain. Explain how these areas will meet ARARs.

92. **Section 6.5.3, Pages 6-37 and 6-38:** It can be inferred from this section that long term effectiveness and permanence for limited removal alternative does not appear to address high PAH areas and NAPL that will remain in the Kreher Park.

93. **Section 6.5.6, Page 6-39:** All limited removal alternatives except Alternative S-3B are considered to be easily implementable. This is not correct because there probably would be significant administrative feasibility issues with on-site landfill and off-site landfill alternatives.

94. **Figure 6-1:** See general figure comments. A more detailed legend and symbols are needed, or else divide the figure into two figures – excavation/demolition plan and containment/restoration plan.

    For example, the text description of Alternative S-3A in Section 6.3.3 indicates that there are two removals (excavation areas). However, only one area in red is shown on the figure. Blue areas seem to indicate asphalt pavement (existing or proposed?), but not indicate excavation in these areas. Further, it is not clear on the figure that any excavation is to take place in the "low permeability cap" area (green hatching).

95. **Figure 6-1:** Is the NAPL to the south of the former tanks/holders bounded? The dashed line used for the NAPL border gives the impression that the boundary is inferred. If so, some pre-design investigation may be warranted to see if the NAPL extents further to the south.

96. **Figure 6-2:** The symbol color for "Kreher Park Extent of Fill" and "Filled Ravine Extent of Fill" are nearly identical – they are difficult to tell apart. Combine the symbols into one or use more contrasting colors.

97. **Figure 6-2:** The legend indicates that the shaded areas are the extent of fill, yet the figure title indicates that this shows unlimited removal. Presumably, they are the same areas. If so, why does the area not match closer to the extent of soil contamination shown on Figure 3-1? A figure showing the sample locations that exceed the RAOs would be helpful, if this is different than Figure 3-1. Alternatively, more explanation in the notes/legend of Figure 6-2 would be beneficial.

98. **Table 6-6, Evaluation of Short Term Effectiveness for Potential Soil Remedial Alternatives:** What types of actions to protect the community and site workers during remediation would be necessary and implemented for each alternative?

99. **Table 6-7, Evaluation of Implementability for Potential Soil Remedial Alternatives:** "Availability of Services and Materials" description for Alternative S-4 does not seem to apply to this alternative since it mentions thermal treatment.

100. **Section 7.3, Page 7-4, Alternative GW-2 – Containment Using Engineered Surface and Vertical Barrier:** Low Permeability Soil Cap is also compatible with the areas of Kreher Park that are not excavated.

101. **Section 7.3, Alternative GW-2 – Containment Using Engineered Surface and Vertical Barrier:** This alternative does not address contamination in Copper Falls Aquifer. Show how groundwater contamination in the Copper Falls Aquifer will be addressed.

102. **Section 7.3, Pages 7-4 and 7-6, Alternative GW-2 – Containment Using Engineered Surface and Vertical Barriers:** It is unclear how this alternative would accomplish containment. As described in the text and shown on Figure 7-1, the surface barriers would reduce some infiltration, but other areas within the extent of soil contamination are left open (i.e. there is no engineered barrier, note: as discussed in several comments above the fill present in Kreher Park does not meet the definition of an engineered barrier for infiltration). Surface water could flow across the surface barriers and then infiltrate into the soil in the uncapped areas.

103. **Section 7.3, Page 7-4, Alternative GW-2 – Containment Using Engineered Surface and Vertical Barriers:** *It is stated that the regional flow conditions in the Copper Falls aquifer indicated that a stagnation zone beneath the center of Kreher Park has prevented the dissolved phase plume from migrating beyond the shoreline.* The groundwater in the copper falls aquifer should be discharging some where, most likely into the lake. There is no evidence that the upward gradient is discharging into the shallow groundwater zone in Kreher Park. The dissolved chemicals will migrate with the groundwater; therefore, the likelihood of a stagnation zone restricting contamination migration is questionable. Provide an explanation in this section where the groundwater from Kreher Park is discharging and explain how the vertically upward flow in Kreher Park is causing a stagnation zone that is restricting contamination migration in the Copper Falls Aquifer. Additional wells will likely be needed to ensure that the contaminants are not migrating beyond the shoreline in the deeper portion of the Copper Falls Aquifer.

104. **Section 7.3, Page 7-4, Alternative GW-2 – Containment Using Engineered Surface and Vertical Barriers:** Provide the estimated number of barrier wells needed for Kreher Park. Provide the estimated extraction rate for barrier wells.

105. **Section 7.3, Page 7-4, Alternative GW-2 – Containment Using Engineered Surface and Vertical Barriers:** *For barrier well it is stated that regional groundwater flow conditions in the Copper Falls aquifer has prevented the dissolved phase plume from migrating beyond the shoreline.* Revise this statement in accordance with the stagnation zone comments in #103.

106. **Section 7.3, Page 7-4, Alternative GW-2, Barrier Wells:** The last sentence of the first paragraph is unclear as to how additional data will ensure that contaminants will not migrate beyond the Park shoreline.

107. **Section 7.3, Page 7-6, Alternative GW-2 – Containment Using Engineered Surface and Vertical Barriers:** Is the sheet piling depth terminating in the Miller Creek formation? Provide a cross section for each side of the sheet piling to demonstrate that the suggested depth of sheet piling is appropriately determined. Also provide the depth of sheet pile termination in the Miller Creek formation.

108. **Section 7.3, Page 7-6, Vertical Barriers, Bullet #8:** Placing a storm water detention pond within the containment facility is likely to increase rather than decrease infiltration into the containment, it will provide an area where water will build up creating a hydrostatic head driving water down into the containment soil, rather than designing for the water to sheet flow off of the containment area unless the basin is has an impermeable liner. What is the rationale for stating that a storm-water basin will restrict infiltration?

109. **Section 7.3, Page 7-6, Alternative GW-2 – Containment Using Engineered Surface and Vertical Barriers:** *It is stated that a 15 pressure relief wells will be installed to periodically remove groundwater and reduce the hydraulic head within the confined area.* It is unclear how the "pressure relief wells" will operate – explain how these wells will be operated? How will the extracted groundwater be managed? If they are operated periodically how will the hydraulic head be maintained below lake level?

110. **Section 7.3, Page 7-7, Alternative GW-3 – In-situ Treatment Using Ozone Sparging:** This alternative is confusing related to whether or not ozone sparging will be implemented for shallow groundwater in the ravine and at Kreher park. The text states:

Air/ozone sparging was retained for further evaluation as a potential in-situ treatment alternative for contaminated groundwater encountered in the underlying Copper Falls aquifer.

The text continues to list obstacles to implementing ozone sparging in Kreher Park, and then states:

The layout of an ozone sparge system for underlying the Copper Falls Aquifer is shown on Figure 7-2.

However, the text lists conceptual design key elements of an ozone sparging shallow groundwater at the upper bluff area and at Kreher Park, and for the Copper Falls Aquifer. Further, Figure 7-2 shows implementation of ozone sparging for the Copper Falls aquifer and for Kreher Park.

111. **Section 7.3, Page 7-7, Alternative GW-3 – In-situ Treatment Using Ozone Sparging:** How will the recovered groundwater and NAPL be managed?

112. **Section 7.3, Page 7-8, Alternative GW-4, In-situ Treatment using Surfactant Injection and Dual Phase recovery, bullet #4:** Clarify the timeframe over which the five injection of surfactant will be administered to achieve removal of the NAPL.

113. **Section 7.3, Page 7-9, Alternative GW-5 – In-situ Treatment using Permeable Reactive Barrier Walls:** Provide cross section for each side of the sheet piling to demonstrate that the suggested depth of sheet piling is appropriately determined. Also provide the depth of sheet pile termination in the Miller Creek formation.

114. **Section 7.3, page 7-10, Alternative GW-5 – In-situ Treatment Using Permeable Reactive Barrier Walls:** *It is stated fluid levels will also be monitored to ensure the hydraulic head within the confined area remains below lake level.* How will this be accomplished without a complete cap, with a porous PRB included as part of the vertical barrier around the confined area, and without pressure relief wells?

115. **Section 7.3, Page 7-10, Alternative GW-5, In-situ treatment using PRB:** The last paragraph states that fluid levels in the confined area will be below lake level, presumably to maintain an inward gradient. How will the PRB function if there is no head differential to drive the groundwater through the PRB? Will the groundwater be pumped? Clarify how the PRB will work.

116. **Section 7.3, page 7-10, Alternative GW-5 – In-situ Treatment Using Permeable Reactive Barrier Walls:** There probably is a need for hydrogeologic modeling for the PRB. Modeling enables an understanding of the implications of site characterization information and treatability data. Hydrogeologic modeling is normally conducted for PRBs for the following reasons:

- Determine an approximate location and configuration for the permeable barrier with respect to the groundwater flow and plume movement.
- Estimate the expected groundwater flow velocity through the reactive cell.
- Determine the width of the reactive cell and, for a funnel-and-gate configuration, the width of the funnel.
- Estimate the hydraulic capture zone of the permeable barrier.
- Determine appropriate locations for performance and compliance monitoring points.
- Evaluate the hydraulic effects of potential losses in porosity (and potential for flow bypass) over the long term.

- Evaluate the potential for underflow, overflow, or flow across aquifers.
- Incorporate the effects of shifts in groundwater flow direction into the design.
- Incorporate site-specific features such as property boundaries, building foundations, buried utilities, etc., into the design.

117. **Section 7.3, page 7-10, Alternative GW-6 – Treatment using Chemical Oxidation:** Is any NAPL removal going to be conducted for the shallow aquifer prior to or during treatment using in-situ chemical oxidation (ISCO)? This would reduce the high oxidant demand caused by the free product, and therefore require a lower reagent dose.

In addition, care must be taken that the NAPL in combination with the oxidant (especially peroxide) does not cause a dangerous exothermic reaction.

118. **Section 7.3, page 7-12, Alternative GW-7 – In-situ Treatment using Electrical Resistance Heating:** A few different possibilities are discussed in the text, but what was the actual approach assumed for this remedy – Is ERH used to heat the surface to near the boiling point of water, or just to 30 to 40 degrees for NAPL recovery? The approach is alluded to in the key components and the figures, but is not specifically stated.

119. **Section 7.3, page 7-15, Alternative GW-8 – In-situ Treatment using Steam Injection / Dynamic Underground Stripping / Contained Recovery of Oily Wastes (CROW) Process:** The text is confusing for what is actually proposed as part of the alternative for the Copper Falls aquifer. Several different processes are discussed in the text (e.g. steam injection alone, DUS, HPO, and CROW), and it is not clear which are proposed for this alternative and which simply could be considered at a future time, especially due to the paragraph order.

120. **Section 7.3, Page 7-16, Alternative GW-9 and Figure 7-8A:** *It is stated in Bullet 1 that a minimum of 12 extraction wells will be installed in the Copper Falls Aquifer.* How were the number of wells determined? What are the expected extraction rates for each well? The number of wells described in text and shown on the figure does not match.

121. **Section 7-3, Page 7-16: Alternative GW-9 and Figure 7-8B:** Provide a basis for determining number of trenches and trench orientation.

122. **Section 7.3, All Alternatives needing groundwater treatment:** For several alternatives the existing groundwater system has been identified to treat the extracted groundwater. An analysis whether the existing groundwater treatment system will be capable of handling the load has not been provided. Also provide the treatment train and outline of testing procedures to meet discharge requirements.

123. **Section 7.3, Alternatives GW-4, GW-6, GW-7, and GW-8:** These alternatives appear to address only upper bluff and contamination in copper falls aquifer. Shallow

groundwater contamination and NAPL in Kreher Park has not been addressed for these alternatives. Therefore these alternatives will address groundwater issues at the site partially. The alternatives should clearly state whether shallow groundwater contamination including NAPL is being addressed for these alternatives or not. Also, the conceptual design for shallow groundwater should be provided.

124. **Figures 7-1, and 7-4:** Why is the low permeable cover not being provided for entire coal tar dump area in Kreher Park?

125. **Table 7-2, Alternative GW-2, Upper Bluff Area:** This table needs to be updated to address comments above (#100 – 124) on groundwater alternatives.

126. **Table 7-3, Evaluation of Long-Term Effectiveness and Permanence for Potential Groundwater Remedial Alternatives:** Grouping together alternatives GW-3 through GW-8 (or GW-9?) is too general. For example, the adequacy of controls for all these alternatives list that they would be effective for the Copper Falls aquifer, although this would not be true for Alternative GW-5 (In-situ Treatment using Permeable Reactive Barrier Walls). Further, Alternative GW-5 would likely not result in the "removal of significant volume of NAPL," since the PRB is only a passive treatment for groundwater that flow through it.

127. **Table 7-3, Alternative GW-2:** The fill at the Kreher Park cannot be considered as an engineered barrier as described in several comments above for surface containment. Therefore, the statement that containment of shallow groundwater will reduce long term potential risk to human health and the environment is questionable because groundwater infiltration into the underlying shallow aquifer will continue and contaminants would continue to leach into groundwater.

128. **Table 7-3, Alternative GW-2:** The fill at Kreher Park cannot be considered as an engineered barrier because it will not reduce infiltration. There for the statement that the containment would be effective for shallow groundwater is questionable.

129. **Table 7-3, Alternatives GW-3 through 9:** Based on the discussion of the alternatives and Figures several of these alternatives (GW-4, GW-6, GW-7 and GW-8) do not appear to address groundwater contamination in the Kreher Park. The long term effect for these alternatives will be unchanged NAPL and groundwater contamination will still remain in the Kreher Park. Due to site conditions in the Kreher Park several of these alternatives may not be successful in treating the NAPL. In that instance the long term effectiveness of the alternatives becomes questionable.

130. **Table 7-4, Alternative GW-2:** Groundwater extraction and treatment will be required and the treatment will slowly reduce contaminant concentration in the Kreher Park area. This should be addressed in this table.

131. **Table 7-4, Evaluation of Reduction of Toxicity, Mobility, or Volume through Treatment for Potential Groundwater Remedial Alternatives:** For the type and quantity of residuals remaining for Alternative GW-9, how will immobile NAPL be removed through groundwater extraction if the NAPL is not mobile?

132. **Table 7-5, Evaluation of Short Term Effectiveness for Potential Groundwater Remedial Alternatives:** What types of actions to protect the community and site workers during remediation would be necessary and implemented for each alternative? Each alternative may have specific protections required and safety concerns to consider for implementation, as well as varying degrees of risk. Grouping all the alternatives together is too general.

133. **Table 7-5, Evaluation of Short Term Effectiveness for Potential Groundwater Remedial Alternatives:** In addition, under "Time Until RAOs are Achieved," note that the RAOs will never be achieved for the Copper Falls aquifer as part of Alternatives GW-2 and GW-5. Grouping Alternatives GW-3 through GW-8 together for this category may be too general since time frames for various in-situ treatments will vary, especially when comparing active systems to passive treatment (e.g. PRB).

134. **Table 7-5, Alternatives GW-2 through 9:** *For protection of community and workers during remediation it is stated that actions to protect community and site workers during remediation can be implemented.* No specific information has been provided for actions to protect the community and workers.

135. **Table 7-5, Alternatives GW-2:** *For environment impact of remedy it is stated that containment will prevent contaminant migration.* This is true only if the water elevation in the containment is kept lower than the water elevations around the containment area.

136. **Table 7-6, Alternatives GW-2:** *For reliability of technology it is stated that containment technology will prevent exposure and contamination migrations via shallow groundwater.* This is true only if the water elevation in the containment is kept lower than the water elevations around the containment area.

137. **Table 7-6, Evaluation of Implementability for Potential Groundwater Remedial Alternatives:** It would seem that the wood waste layer would result in more than minor installation problems for Alternatives GW-2 and GW-5, especially if the wood waste layer contains full-size logs and lumber. In addition, containment is not always a reliable technology, especially for difficult or unknown subsurface conditions.

138. **Table 7-6, Evaluation of Cost for Potential Soil Remedial Alternatives:** Revise the table number and title to "Table 7-7, Evaluation of Cost for Potential Groundwater Remedial Alternatives."

In addition, why is GW-2 over twice the cost of GW-5? They are nearly identical, except that GW-5 includes a PRB and GW-2 includes "pressure relief wells." Why does Alternative GW-5 not include costs for the upper bluff, when Figure 7-4 shows the same asphalt as Alternative GW-2?

Why is Alternative GW-8 less expensive than Alternative GW-7, when based on the text description of GW-8, DUS includes steam injection, electrical heating, underground imaging, and collection/treatment of effluent, whereas GW-7 includes just the electrical heating and collection/treatment of effluent?

139. **Table 7-8, Comparison of Potential Groundwater Remedial Alternatives:** Alternative GW-2 likely has no to low (instead of moderate) reduction of toxicity, mobility, and volume through treatment, since nothing is being treated – essentially, the contaminants are just contained.

Due to the problems posed by the wood waste layer and fill material, as well as the difficulties posed by breaching the confining layer, it would seem that not all of the alternatives are highly to very highly implementable.

In addition, some of the alternatives may be less than highly effective in the short term, due to potential safety concerns and exposures to workers and the community during implementation, especially for more intrusive remedies.

140. **Section 7.5.2, Compliance with ARARs and TBCs:** For alternatives that are not addressing NAPL and contaminated groundwater in Kreher Park, compliance with ARARs for those alternatives is questionable.

141. **Section 7.5.3, Long Term Effectiveness and Permanence:** *It is stated that although risk will be reduced by containment of contaminated material, contaminants will be left on site. Additionally, both are limited to shallow groundwater; neither is a feasible alternative for the underlying Copper Falls aquifer.* Is the contamination in the Kreher Park a source of contamination for the underlying Copper Falls Aquifer?

142. **Figure 7-1:** The cap does not extend over the entire area of the former coal tar dump and at a minimum should extend over the entire area of the former coal tar dump. The cap should extend over the entire site to prevent infiltration of precipitation through contaminated soil.

143. **Figure 7-1:** Where is the groundwater diversion trench located on the figure that is mentioned in the text for Alternative GW-2? In addition, see general figure comments regarding figure and legend symbols.

144. **Figure 7-1:** The storm water detention basin will allow more infiltration to occur. A storm water management system should be designed to ensure that no ponding occurs.

145. **Figure 7-2:** The text of Alternative GW-3 mentions that groundwater extraction wells will likely be needed to recover mobilized NAPL. These wells should be shown on the figure as part of the alternative, even if existing extraction wells are used.

146. **Figure 7-3:** The line type colors of the buildings, NAPL, and ravine are very similar, making it more difficult to interpret the figure. In addition, the ravine line type is not defined in the legend, although shown on the figure.

147. **Figure 7-3:** Again, the existing treatment system should be shown on the figure (or labeled if already shown) since it will be used as part of this alternative.

148. **Figure 7-3:** It seems as though additional injection points are needed to fully cover the extent of NAPL.

149. **Figure 7-4:** Show the location of the groundwater diversion trench installation.

150. **Figure 7-5B:** Show the location of the existing extraction wells in addition to the new proposed – label accordingly.

151. **Figure General:** A figure would be helpful showing the location and details of the chemical oxidation at Kreher Park completed in the former coal tar dump area.

152. **Figure 7-6A:** In the legend, how can "SVE wells" be passive? If they are passive vent wells, then they are not actively extracting vapor from soil (i.e. SVE). If these 10 wells are the passive vent wells, then also show the 4 extraction wells.

153. **Figure 7-7A:** Where is the Kreher Park area? Also, the number of wells shown on the figure is not consistent with the text description.

154. **Figure 7-7B:** Is steam injection alone proposed for the Copper Falls aquifer, or is the combination technology of DUS proposed as indicated by the text? The figure seems to only show steam injection and steam recovery, whereas DUS incorporates several different technologies not shown on the figure. Are the recovery wells for steam as indicated by the figure legend, or are they for recovery of NAPL and groundwater?

155. **Section 8, Sediments:** A "dry dredge" alternative should be considered. For example, if you are willing to construct a sheet pile wall for a CDF remedy, it would also make sense to put up a sheet pile wall to help "dry out" a portion of the bay so that it would be easier to excavate (dredge) the contaminated areas. This should be looked at as either a winter or summer alternative. The discussion should include seasonal options such as winter versus summer removal and impacts.

156. **Section 8, Sediments:** Table 8-2 Evaluation of Long-term Effectiveness and Permanence for Potential Remedial Alternatives for Sediment, overstates the "Adequacy and Reliability of Controls", or permanency of options SED-2 and SED-3. If a CDF is constructed on the lakebed it would be through a lakebed grant by the Legislature, or as a bulkhead line or lease pursuant to Section 30.11 or 24.39, Wisconsin Statutes. A bulkhead line can only be created by the City when it's in the "public interest," and a lakebed lease can only be entered into with a local unit of government (the City of Ashland, or Ashland County) for specified purposes and can only be granted for 50 years. Fifty years or two and one-half generations may not be considered permanent. It is difficult to predict whether a lakebed grant could be "re-granted" for either SED-2 or SED-3. This future speculation makes it difficult to determine the permanence of this option. The technologies involved in SED-2 and SED-3 may have been used before at other sites. However, these technologies have never been used on sites with free product. Because these technologies have never been used at free product sites the permanence of the technology may be overstated both technically and at an administrative level.

For the SED-4 option the narrative within the table includes a discussion of the potential short term release of VOCs during sediment excavation. Table 8-2 relates to the "Evaluation of Long-term Effectiveness and Performance" not the short term release and as such the narrative should be moved to table 8-4 Evaluation of Short Term Effectiveness.

The tables in Chapter 8 are out of order and some appear to be mislabeled. On page 8-19 the table is labeled as table 8-4 and 8-3. The table on page 8-24 is labeled as 8-3 but it follows table 8-6 on page 8-23. Please revise the table labeling in Chapter 8.

157. **Section 8.3, Development of Potential Remedial Alternatives for Sediment:** Page 8-5. The CDF will eliminate approximately six acres of open water of Lake Superior which is protected under the Wisconsin Public Trust Doctrine and held in trust for the public (see Wisconsin Public Trust discussion below).

Page 8-5. The document states, "compensatory mitigation for wetland loss would be required" for the loss of open waters of Lake Superior. There is no applicable mechanism for mitigation of loss of public lakebed. References to mitigation/restoration projects on Page 8-6 are also inappropriate for consideration as there are no mechanisms or provisions in state statute for the "trade-off" of lakebed for other restoration projects or access easements.

Page 8-5. The document states, "[t]he design of the CDF would be compatible with the recreational nature of the near shore area and incorporate features that will enhance both recreational use of the area as well as wildlife usage". There is a concern with that statement. While a CDF would change or modify recreational uses, dredging would actually enhance or restore previous recreational uses. This would allow greater flexibility to enhance near shore recreational opportunities in the future.

Page 8-5. The references to "grassland habitat" and management "for recreational use by the public, i.e., boaters, fishers, birdwatchers, etc." are interesting concepts but inconsistent with the loss of lakebed associated with the filling of open water for a CDF. These recreational uses referred to currently exist in the area and there will be an irreversible loss of open water and its associated recreational uses and ecosystem functions if a CDF is constructed.

Page 8-5. The Ashland Waterfront Development Plan does not contemplate construction of a CDF as part of a plan to expand their marina as the document suggests. In fact, the Waterfront Plan shows expansion of marina slips into the very area that NSPW is proposing for the location of the CDF.

Page 8-7. As described in the section on Subaqueous Capping, the result will be changes to the shoreline and open water area as "approximately 20,000 cy of clean fill and riprap will be placed in the near shore area." Human usage, habitat values, and the natural character of the shoreline will all be altered with this alternative.

Page 8-8. The document acknowledges that dredging is technically feasible for this site and has been successfully implemented alternative at other sites.

158. **Section 8.3.2, page 8-4, Alternative SED-2, Sediment Containment with a Confined Disposal Facility:** On Figure 8-2, it shows sheet pile installation, yet this is not mentioned in the text.

159. **Section 8.3.2, Alternative SED-2: Sediment Containment within a Confined Disposal Facility:** There is a concern about the treatment of water within a CDF. Information is needed on the water management issues within the CDF including how the water is managed, treated and discharged. The FS refers to drainage wells or wicks within the CDF and drain tile at the upland side. Upon reviewing the cost estimates, it appears a carbon filtration treatment system for water during construction is being considered, but no details are provided. There is also a concern about whether the CDF can be dewatered enough to make it stable to support the cover and prevent water and contaminants from migrating into the cover. In addition, there are concerns that once the initial dewatering ceases, water will re-enter the CDF thereby compromising the integrity of the cap and the entire remedial alternative. There appears to be no method to either monitor the amount of infiltration or remove the water if it enters the CDF.

Additional information is needed on: how will groundwater on the up-gradient side of the CDF be collected, treated and discharged? Where will the sheet pile be installed other than along the newly created shore line? Will it be installed on all sides of the CDF during construction? Figure 8-2 only shows it on the lake side and along the RR tracks. What sort of sheet pile will be used? Will the sheet piling be sealed to prevent contaminant migration?

Exactly what areas will be capped? How will the cap be sloped? How will drainage be managed? More details on how the cap will be maintained are needed.

Looking at this section, the drawings and the summary of the bench testing results, please address how the CDF design will be effective in preventing exposures and contaminants from migrating in the long term. Notwithstanding the design and location requirements in NR 500 (discussed below), it appears that the following potential problems have not been adequately addressed in the FS:

- Leakage through the sheet wall due to inadequate sealing and/or corrosion/deterioration. What will a major storm due to this structure? Was a storm of a certain type and magnitude looked at and considered for the design? Were wind speeds, wave height and precipitation events documented and the impacts these may have on the sheet wall? Does the sheet wall alternative take into consideration Lake Superior lake levels declining as well as potentially rising? What if there is a major storm as well as a significant rise in lake levels?

- Rising lake levels causing additional saturation of the waste and inundation of the cover.

- Inadequate dewatering and stabilization of the wastes causing cover saturation and/or structural failure. The description of the bench testing done does not prove with certainty that there will not be cover saturation and/or structural failure of the CDF if there is inadequate dewatering or waste stabilization. The bench scale test used only small amounts of material and may not be indicative of the conditions faced in a CDF.

The alternative does not contain a gas collection system. Gas generation may cause cover vegetation stress, cover deterioration or even structural failure if large gas pockets form. A large amount of untreated significantly contaminated material is going to be placed and covered in this area. The submittal should address the potential bacterial decomposition and associated gas generation. The testing summary stated: "Ebullition (gas release) in the underlying wood layer during the consolidation period is possible, however, conditions would no longer favor gas releases after the relatively rapid consolidation of the wood layer and the dredged slurry layer that would take place during the slurry deposition and cap placement time, say 180 days." What documentation exists to support that these conditions will not be favorable for gas generation after 180 days?

There is still a concern regarding the construction of a CDF on the bed of Lake Superior with significantly contaminated material, and with NAPL present.

160. **Section 8.3.2 Alternative SED-2:** This alternative proposes building a hazardous waste landfill on Kreher Park and on 6 acres of Lake Superior lake bed. No leachate collection system is proposed for this landfill and no gas collection management system is proposed to depressurize the landfill from build-up of landfill gas. No water

treatment system is proposed to treat the groundwater extracted to maintain an inward gradient. Due to the nature of the dredged fill material it will take years before the material acquires enough strength to support a cap. Differential settlement across the site may make the site unusable for any type of recreational activity for years.

161. **Figure 8-2:** The depiction of trees on the cap in Fig. 8-2 is misleading, tree root systems require a much deeper soil layer than is being proposed here and would compromise the integrity of the cap, and therefore, trees are not typically plated on a RCRA Class C or D cap.

162. **Section 8.3.2, Page 8-4, Alternative SED-2:** Provide conceptual cross-sections for the caps described in this section.

163. **Section 8.3.2, Page 8-4, Alternative SED-2:** The approval to build a CDF in the lake bed could face significant legal and regulatory hurdles that probably will cause significant delay in implementation. As a threshold matter it is unclear this alternative is protective or meets ARARs and TBCs. Provide details about how and when NSPW will seek approval for a CDF. Whether a CDF has approval is an important factor as to whether this alternative can be implemented. The acceptance of this alternative by the State and community is also questionable at this time.

164. **Section 8.3.2, Alternative SED-2:** Why are the O&M costs the same for the CDF as for the other alternatives? Won't there difference in O&M cost for each alternative?

165. **Section 8.3.2, Page 8-6, Alternative SED-3:** In bullet Item 1 it states, *"Determine the area of sediment containing significant wood debris and free-phase material with concentrations of PAH greater than 9.5 PAH/g dwt at 0.415% OC.* Show extent of this area on a figure using RI information.

166. **Section 8.3.2 and 8.3.3:** How will the RAO for removal of NAPL be addressed for the CDF and capping alternatives?

167. **Section 8.3.3, Alternative SED-3:** Provide a rationale for selecting 4-feet depth of excavation for sediments. Does 4-feet depth of excavation guarantee removal of all free product.

168. **Section 8.3.3, Alternative SED-3: Subaqueous Capping:** The capping alternatives should include design for preventing damage by navigation including anchor dragging, scour from boat motors, and boats running aground as well as natural occurring erosion from storms and ice damage.

In January 2008, NSPW submitted the ADDENDUM 1 CAP FLUX TEST - EXTENDED DURATION COLUMN bench scale study report for review. The report, which presents additional results of the Cap Flux treatability study for the Ashland/Northern, states:

As part of the test protocol, a sediment column capped with three feet of sand was allowed to run an additional three months (six months total) to compare to the results of a similar column which only ran for three months. The primary differences observed in the six month test included the following:
1) The rate of gas generation increased substantially after three months;
2) More gas was generated in the last three months than in the first three months; and
3) At the termination of the six month test, somewhat higher levels of PAHs and VOCs
were measured in both the bottom and top of the sand cap compared to what was measured after three months.

Although after 6 months the concentration of VOCs and PAHs were below the cleanup goals prescribed for the sediments in the test there were increasing trends which raise concerns over the long term effectiveness of the cap. The ability of these caps to perform as a permanent solution seems questionable.

169. **Section 8.3.3, Alternative SED-3: Subaqueous Capping and 8.3.4 Alternative SED- 4: Removal:** The descriptions and cost estimates for these two alternatives do not adequately take into account the final landfill deposition. While the narrative discusses off-site landfilling, there is also a section on siting and constructing a new landfill in the area for the material and an evaluation of a new landfill in Appendix C. NR 500 Wisconsin Administrative Code outlines the requirements for siting a new landfill. It should be noted that designing, siting and approval of a new landfill site may take considerable time that will have to be accounted for in the project schedule. Please see comments on Appendix C.

170. **Section 8.3.4, Alternative SED- 4: Removal:** The description in this section and the figures provides very little detail. What is the aerial extent of dredging? Where will the dewatering and water treatment ponds or structures be located? Will there be room for them near the shore? If there is inadequate space near the shore, will an inland site be needed?

171. **Section 8.4, Detailed Analysis of Retained Remedial Action Alternatives – Sediment:** Page 8-11. The mechanism normally used for construction of a CDF is a lakebed grant from the Legislature. Lakebed grants and submerged lands lease alternatives discussed here all involve a finding that the proposed fill or structure is in the "public interest" or enhances a Public Trust purpose. The other mechanisms are Section 30.11, Stats., which allows municipalities to establish, with DNR approval, "bulkhead lines". Such lines must be determined to be in the "public interest" by DNR and "shall conform as nearly as practicable to the existing shore."

The other mechanism is a "lease" from the Board of Commissioners of Public Lands under Sections 24.39 and 30.11, Stats. Leases can only be granted for limited, specified purposes, which are outlined in sub. 24.39, Stats. These include, for a

municipality, "improvement or provision of recreational facilities related to navigation for public use" and for riparian owners, "[i]mprovement of navigation or for improvement or construction of harbor facilities."

Lake bed grants and leases can only be issued to a municipal government which would require the cooperation of the City. The proposed CDF will have a difficult time meeting the intent of sub. 24.39 Stats. This raises the issue of who will be responsible for long term maintenance particularly if there is a major failure of the CDF and a release to environment? The City as grantee or owner of the CDF (required by statute) would potentially incur long-term liability. Funds would need to be set aside to cover needed inspection and maintenance of the facility in perpetuity and should be factored into the cost estimate. Further CDF analysis is necessary to demonstrate that the stability and longevity of a CDF will result in a permanent solution.

Page 8-12. Comparisons between the Ashland Superfund site on Lake Superior and the Lower Fox River site are difficult as there are significant differences between Lake Superior and this riverine system and its associated pollutants, morphology, and water quality.

The Wisconsin Public Trust Doctrine established in Article IX, Section 1 of the Wisconsin Constitution, as interpreted by the Wisconsin Supreme Court and the Attorney General, requires that any development that involves the filling of lakes and streams must be substantially related to navigation or its incidents. The State holds navigable waters in trust for all of its citizens and is responsible for protecting commercial and recreational navigation and public rights in navigable waters, including boating, fishing, hunting, swimming, and enjoyment of natural scenic beauty. Prevention of pollution and unhealthy conditions and protection of fish and wildlife habitat are among other public interests that the State is responsible to protect for the public.

References to other in-water CDF's in Wisconsin are based on each fact situation and the nature and characteristics of the sediment and pollutant levels at each location. The State has been consistent in its approach on similar projects involving Wisconsin waters of Lake Superior and its tributaries including the St. Louis River Duluth Tar Superfund site and Newton Creek-Hog Island Inlet. In all of these sites the polluted sediments were or will be removed to an acceptable level by dredging to permanently remove contaminants from the bed of the waterway. A new confined disposal facility has not been sited in many decades in part because of public opposition and technical questions about the permanence and environmental acceptability of in-water disposal. There have been no cases where a CDF has been approved that permitted on land solid wastes to be deposited on the lake bed in Wisconsin waters. As previously stated, there is not adequate data to compare the true design, maintenance and long-term costs of each of the proposed alternatives.

172. **Section 8.4.1.1, Overall Protection of Human Health and the Environment:** This section has no analysis of protectiveness for any of the sediment alternatives.

That seems to be further discussed in 8.5.1, which will be commented on below. Refer to the actual section where the discussion takes place.

173. **Section 8.4.1.2 Compliance with ARARs and TBCs:** General - there is very little specific discussion in this section about how each alternative meets ARARs. The text refers to Table B-3 in Appendix B, but that only outlines what the ARARs are and has a "yes" or "no" about whether the ARARs apply and if the alternative complies with it. There is a lack of specific details on how a number of important ARARs are met. A discussion on how each alternative meets the ARARs will be required for a complete and thorough review.

For Alternative SED-2, the NR 500 series of Wisconsin Administrative Codes is an ARAR for this alternative because a CDF which contains dredge material and solid waste is a solid waste disposal facility. Landfill location, performance, design and construction criteria will have to be met along with all other applicable portions of the NR 500 series of Wisconsin Administrative Codes.

For Alternative SED-2 –CDF, Removal and MNR, the substantive requirements of NR 500 series of Wisconsin Administrative Codes are applicable to a CDF that is receiving new material. This includes the location and design standards. There is no discussion that outlines how this alternative meets those requirements. As mentioned before, a discussion on how each alternative meets the ARARs will be required for a complete and thorough review. Table B-3 says all the sediment alternatives meet NR 500-520 with no further discussion. This alternative might not meet all of those requirements. A thorough discussion of how each alternative meets the ARARs should include discussion on CERCLA ARAR waivers or NR 500 exemptions if those ideas are being considered. NSPW identified the NR 500 beneficial reuse section as a TBC in table B-3 and indicated that it doesn't apply; please provide justification as to why it will not apply in the narrative.

The lack of specificity for how air and surface water quality standards will be met during dredging implementation is also a problem. However, this lack of specificity for how air and surface water standards will be met is a problem common to all the sediment alternatives that involve dredging except for the no action alternative. There is a need to address any air issues, including volitization, associated with sediment management in impoundments or the CDF until the material is covered or capped.

For Alternative SED-4 – Removal, Treatment, Disposal and MNR, how will: "Treated sediment would be sent off site for beneficial reuse" be done? Doesn't the FS call for the treated sediment to go to an NR 500 landfill? A distinction needs to be made between "clean" overburden sediments and contaminated sediments and the final disposition of these two materials.

174. **Section 8.4.1.2, Compliance with ARARs and TBCs:** For Alternative SED-2 a CDF is being considered. CDF is quite simply just another name for a landfill. A CDF is typically constructed off shore for containment of clean material dredged for navigational purposes. The alternative SED-2 involves, in this case, removal of contaminated soils and waste NAPL from the upper bluff area and removal of contaminated sediments and waste NAPL from the lakebed and permanently taking, permanently filling in both Kreher Park and 6 acres of Lake Superior lake bed, waters of the State of Wisconsin, in what clearly can be best described as a landfill. It would be a landfill to contain hazardous waste and would be subject to Wisconsin NR 500. This alternative must describe how it meets the requirements for a landfill under NR 500, especially the requirements for location of a new landfill. If the CDF does not meet NR 500 requirements it will not meet ARARs.

175. **8.4.1.2 Compliance with ARARs and TBCs:** Examples of aquatic CDFs have been cited. The CDFs cited are for sediments that were removed to improve water navigation, construction of harbor facilities, and recreation. The sediments in the CDFs cited have no or very low levels of contamination. The sediments being removed at the site contain free-product NAPL and highly contaminated sediments. Therefore, construction of an aquatic CDF in the lake will face significant technical, and legal hurdles and construction of such a CDF will likely cause significant delays.

176. **8.4.2.1 Long Term Effectiveness and Permanence:** Table 8-2, Evaluation of Long-term Effectiveness and Permanence for Potential Remedial Alternatives for Sediment, should be modified to account for comments 157 and 158, above. The minimal descriptions and design information provided in this report do not address the questions and issues related to how well the implemented controls will perform over time and prevent contaminant migration.

177. **Section 8.4.2.3, Short Term Effectiveness:** Page 8-21, the report describes the potential for volatilization of contaminants during dredging and discusses control measures concluding that there are "no practical engineering controls". The report should mention that there are options for controlling volatilization and exposure to the community including the timing of work activities to favorable wind conditions and performing the work during colder weather periods that are less favorable to volatilization. Other MGP sites have successfully managed air emissions from sediment and soil cleanups. There are also options including hydraulic dredging into a controlled environment where emissions can be managed. Odors/emissions remain a very significant concern to the Ashland city residents and have to be more adequately addressed.

The description in this section and the figures provide very little detail. What is the aerial extent of capping? What areas will be dredged? Where will the dewatering and water treatment ponds or structures be located? Will there be adequate space for them near the shore? Which capping design will be used? How will it prevent contaminant migration? How exactly will it be armored? Lake Superior is subject to

severe storms, ice damage, and erosion. How will these specific factors be accounted in the design?

179. **Section 8.4.2.4, Implementability:** Table 8-3. Evaluation of Reduction of Toxicity, Mobility, or Volume through Treatment for Potential Remedial Alternatives for Sediment:

The reliability discussion for SED-4 seems to be for SED-2 - is this a typo?

Obtaining the legal and administrative approval for a CDF calls into question the feasibility of SED-2 (see discussion in 163 above). SED-2 doesn't seem to comply with ARARs; including NR 500 (also see comment 180).

180. **Section 8.5.1, Overall Protection of Human Health and the Environment:** Given comments 159 and 168 above, it appears that the overall protectiveness of SED-2 and 3 are in doubt over the long-term. Any further assessment of SED-2 and SED-3 will require superior designs to assure adequate protection.

181. **Figure 8-2**: Why are trees shown on the RCRA class C or class D cap? This would seem to counteract the benefit of the cap, since the root system of full-size trees could potentially damage the cap and cause migration pathways through the soil.

182. **Figure 8-3**: It would be helpful to show on this figure (or a similar figure) the proposed location of the CDF in plan view – or will it encompass the entire recreation area? Note that constructing a CDF with a RCRA cap may limit the types of structures and vegetation can be placed in this area (i.e. may be limited to grassy vegetation and low-impact structures, like trails and picnic tables, etc) – this point should be mentioned in the text, as it may affect future development plans, especially within the civic and commercial redevelopment areas.

178. **Figure 8-5:** What kind of subaqueous cap is proposed for this alternative? Showing one general schematic for a cap specific to the site would be more helpful than showing several different examples of caps from various other sites. Even if the exact type and details are still to be determined, what is assumed for cost purposes? In addition, it would be helpful to show the proposed subaqueous cap location as a figure in plan view.

179. **Figure 8-6:** Showing the proposed sediment removal area in a plan view on a figure would be helpful, possibly combined with the subaqueous cap location figure if they are the same area. Even if the exact area is yet to be determined pending additional sampling, what was assumed for cost purposes?

180. **Table 8-2, Alternative SED-2:** In the long-term SED-2 may not be effective because the sheet pile could deteriorate, fail and require replacement.

181. **Table 8-2, Alternatives SED-3 and SED-4:** The risk of increased exposure to the nearby residents will be for short term and most likely only when highly contaminated sediments and free product is removed.

182. **Table 8-4, Evaluation of Short Term Effectiveness for Potential Remedial Alternatives for Sediment, Pages 8-19 to 8-20:** Revise the header of this table – two headers/titles are currently listed.

183. **Table 8-4, Alternatives SED-3 and SED-4:** The risk of increased exposure to the nearby residents will be for short term and most likely only when highly contaminated sediments and free product is removed.

184. **Table 8-4:** *It is stated that if sediment is disposed off site without treatment, environmental liability is simply transferred to another location, thereby potentially impacting its new location.* Doesn't this apply to alternative SED-3. If the landfill is well designed and constructed (with liner, leachate and gas collection systems) the environmental impact could be controlled.

185. **Table 8-3, Evaluation of Reduction of Toxicity, Mobility, or Volume through Treatment for Potential Remedial Alternatives for Sediment, Pages 8-24 to 8-25**: Revise the table number and header of this table to "Table 8-7, Evaluation of Implementability for Potential Sediment Remedial Alternatives."

In addition, installation of sheet pile through the wood waste layer for the CDF might be difficult from a technical feasibility aspect.

186. **Table 8-3, Page 8-24:** The reliability of Alternative SED-3 is doubtful because free product could migrate upward through the cap over a long term period (note: the bench scale testing is considered for a short term and results of the testing cannot be extrapolated for a long term type of remedy).

187. **Figures General:** Fig. 1-2 SITE FEATURES - The pipe that discharged from the MGP area to the historic lakeshore and later the seep area is shown on the map as a line but is not labeled. There is a "note" at the bottom of the figure that states "Former MGP features are shown on Fig. 1-3". There is no Fig. 1-3 in the draft FS although a figure depicting the MGP facility would be helpful.

Fig. 3-1 LATERAL EXTENT OF SOIL CONTAMINATION IN UPLAND AREA AND KREHER PARK
The green line that depicts the extent of soil contamination in the Kreher Park and upland areas needs to be connected. There is no clean area along the railroad grade as depicted in the drawing.

Fig. 3-2 LATERAL EXTENT OF SHALLOW AND DEEP GROUNDWATER CONTAMINATION

Again for both the shallow and deep groundwater contamination plumes, the areas below the upper bluff and Kreher Park need to be connected. There is no clean area below the railroad grade.

Fig. 3-3 AREA OF IMPACTED SEDIMENT
The key shapes do not match the map shapes for contaminants. At each sample location the color of the highest concentration from that location should be the color noted on the map.

188. **Figures General:** Some of the symbols did not print out properly, such as the north arrow and the legend symbols, which makes it difficult to interpret the figures.

189. **Figures General:** More description is needed in the legends or the notes of the figures to identify the features (historic, existing, proposed, etc) and describe how various extents (contamination, excavation, etc.) were determined.

190. **Figures General:** Several alternatives mention using the existing on-site treatment system. Where is this system currently located? It would be helpful to show on the figures, especially for alternatives that will use the existing system for treatment.

191. **Figures General:** It would be helpful to include some potentiometric maps and geology cross sections with the figures of this report. Even if they are already in the RI, it would be beneficial to include just a few representative ones with the FS to make it a stand-alone document.

192. **Appendix A Volumes and Areal Extent of Contaminated Media:** It would be helpful to show the sub-areas that were used in computations (e.g. Lateral Extent – Upland Area, Former Gas Holder Area, Former Clay Pipe Area) on a figure for reference.

In addition, volume computations for sediments should be broken down into "contaminated sediments" and "overburden". It is clear from the sediment sampling over time that much of the wood waste was deposited after the releases of MGP wastes occurred. The ultimate disposal/treatment of the relatively clean wood waste overburden will most likely be different than the contaminated sediments.

193. **Appendix A Volumes and Areal Extent of Contaminated Media:** Is the extent of contamination at the Former Gas Holder Area and the Former Clay Pipe Area also based on the where benzene exceeded the RCL? If so, list in assumptions.

194. **Appendix A Volumes and Areal Extent of Contaminated Media:** Why does the acreage vary for the lateral extent of sediment contamination with total PAHs exceeding 10 ppm? More explanation is needed on how these areas were determined if Total PAHs exceeding 10 ppm was used in all cases, yet the areas vary.

195. **Appendix C Summary Cost for Siting, Constructing, and Operating a Landfill in Ashland:** The Draft Feasibility Report evaluates several alternatives for addressing contaminated soils, contaminated sediments and impacted groundwater. Alternatives are presented for removal of some or all of the contaminated soil and sediment, which subsequently require disposal.

NSPW owns an industrial landfill facility near Ashland, in Bayfield County, referred to as the Woodfield Landfill. It is currently designed for disposal of ash from the Ashland power plant. Although not noted in Appendix C of the report, use of the Woodfield Landfill should be considered. This option would entail the development of an expansion of the existing landfill (contiguous or non-contiguous). A proposal for development of a landfill expansion at this location would require a significant change from the design of the existing landfill to handle the subject contaminated material. Developing an expansion at this location will require the completion of all steps associated with siting a landfill. Appendix C of the report generally presents the process for siting a landfill. It indicates that siting a landfill for the contaminated material will cost approximately $16 million from the request for an Initial Site Inspection through construction and closure, with 40 years long term care. NSPW also notes an additional $2.5 million for transport of the contaminated material. As mentioned above, this review did not include a detailed evaluation of the cost estimates presented.

196. **Appendix D General:** The cost estimates do not seem to include costs for some of the key elements described in the text for several of the alternatives. For example, costs for shoring deep excavations or excavations near buildings do not seem to be included in any of the alternatives. Detailed cost estimates should at least include costs for the key elements described in the text. Further, some alternatives describe several different possibilities and alternate technologies, but it is not always clear what is assumed for cost purposes, and what costs are not included.

197. **Appendix D General:** How were the percentages selected for mobilization/demobilization, engineering, and construction oversight for each alternative?

198. **Appendix D General:** Present value costs were calculated for the O&M costs of the sediment alternatives, but not for the soil or groundwater alternatives. Using a discount rate of 7% over 30 years will significantly reduce the present value costs of those alternatives that require long-term O&M.

199. **Appendix D General:** Following the examples from the US EPA's *Guide to Developing and Documenting Cost Estimates During the Feasibility Study*, percentages for mobilization, engineering, construction oversight, and contingency should be applied to the total capital cost separate from the O&M costs, which should have its own percentages applied. Present value cost should be calculated for those components that have costs applied over a couple years or more. This analysis will have the greatest impact for the costs applied over the longest durations.

200. **Appendix D Table D-2, Alternate S2: Containment Using Engineered Surface Barriers:** Should cost be included for removal of the WWTP or for a cap in this area? This was mentioned in the text. If not, then perhaps state in the text that this is not included for cost assumptions.

Further, in the text it mentions that a RCRA class C or D cap will be placed over the former coal tar dump area. Presumably, Subtitle D was assumed for cost purposes. This should be stated in the text and on the table, because it will make a significant difference in cost, given that a RCRA subtitle C cap is for a Hazardous Waste landfill. This comment may apply to other alternatives, as well.

201. **Appendix D Table D-4, Alternate S3B: Unlimited Removal and Off-site Disposal:** The cost for installation of sheet pile for dewatering (which may be a significant cost) does not seem to be included in Table D-4.

202. **Appendix D Table D-4, Alternate S3B: Unlimited Removal and Off-site Disposal:** Is $50,000 sufficient for the dewatering equipment? What number and kinds of pumps/tanks will be used? How was the 5 gpm flow rate determined?

203. **Appendix D Tables D-5, D-6, D-7, D-8:** Long-term O&M is not included in the cost, but is mentioned in the text for the key components (periodic inspection and repair of caps).

204. **Appendix D Tables D-6 and D-7:** These alternatives do not seem to include sorting cost to sort out "unsuitable material" that cannot be treated (e.g. cinder blocks and wood waste) from the soil. Is this cost considered with excavation costs?

205. **Appendix E Table E-3, Alternate GW3 – Ozone Sparge:** Cost for a pilot test, which is included in the text description, should be included in the cost for this alternative.

206. **Appendix E Table E-4, Alternate GW4 – Surfactant Injection and Dual Phase (Vacuum Enhanced) Recovery:** Costs for a pilot test and wastewater treatment plant upgrades are mentioned in the text description of this alternative; these costs should be included in the cost table. In addition, the cost table includes cost for waste water disposal by vac truck, whereas the text description states that the recovered fluids will be treated and disposed by sanitary sewer; please clarify.

207. **Appendix E Table E-5, Alternate GW5 – Permeable Reactive Barrier Wall:** Include costs for demolition of the WWTP in the cost table, or state in the text that this is not included for cost assumptions. Include costs for obtaining institutional controls, grading, and for PRB reactive material replacement (or state that they are not included in the text).

208. **Appendix E Table E-6, Alternate GW6 – In-situ Chemical Oxidation:** How many oxidant applications are assumed for this alternative? The text indicates that "multiple applications" would be required, and the cost table lists reagent injection on a weekly basis, making it difficult to evaluate. Is it one injection per week? Also, include costs for grading and cap inspections.

209. **Appendix E Table E-7, Alternate GW7 – Electrical Resistance Heating:** Include costs for vapor-phase treatment using carbon adsorption and removal of buried gas holders, as described in the text. Include costs for asphalt/cap inspections.

210. **Appendix E Table E-8, Alternate GW8 – Dynamic Underground Stripping:** Include costs for vapor-phase treatment using carbon adsorption, as described in the text. Should costs for electrical heating and underground imaging be included for the Copper Falls Aquifer, as well?

211. **Appendix E Table E-9, Alternate GW9 – Enhanced Groundwater Extraction:** Include costs for asphalt/cap inspections.

212. **Appendix F Preliminary Remediation Cost Estimates for Sediment:** The overall costing process seems to be inconsistent between scenarios and incorporate process steps that may be excessive or unnecessary. The FS text provides little information on design decisions specific to each alternative so the decision making process is not entirely clear. Some scenarios call for dewatering and conditioning of the sediment using both filter presses and cement stabilization. Other alternatives specify one or the other. The alternatives should be consistent and specify treatment processes appropriate to the removal method, treatment and disposal processes. Additional information in the report text might be helpful in understanding the decision-making process.

For example in Alternative SED-3A the design calls for mechanical dredging followed by filter press dewatering and then cement stabilization. Since this is a mechanical dredging alternative we can assume the sediment will be at an in place density with little additional water. The sediment will have a relatively high solids content and debris content that will make filter press usage difficult. Cement stabilization is a more appropriate conditioning process. Consideration should be given to dropping the filter press treatment and screening in this alternative for a substantial cost savings.

Alternative 3-C also proposes both filter presses and cement stabilization. If the stabilization is deleted the costs will be reduced.

Alternative-4C also specifies both filter presses and cement stabilization. Unless the consultant can justify otherwise it is recommended that as a hydraulic dredging alternative filter presses are more appropriate and cement stabilization be deleted at an estimated cost reduction.

Wood disposal in roll off boxes has been estimated at $75 per cu. yd. or $128/ ton compared with sediment at $43/ ton. This cost seems very high and in some scenarios approaches the cost of disposal of the sediment.

Landfill disposal costs appear to be estimated too high. The consultant should provide justification for estimating cost based on hauling the waste to Eau Claire instead or other closer alternatives.

Consideration should be given to re-analyzing and submitting the remediation cost analysis for review. The alternatives should propose only as much work as necessary to complete the work described in the alternatives using the most cost effective technologies and approaches.

213. **Appendix F General:** Costs in Appendix F are more descriptive and inclusive than Appendices D and E; costs in Appendices D and E should be of consistent level of detail as Appendix F.

214. **Appendix F General:** It appears as though construction oversight is included twice in the cost – once as Misc Item No 3 and then again as 15% of the total capital cost.

215. **Appendix F Tables F-9 and F-10:** Revise heading of "Mechanical Dredging..." to "Hydraulic Dredging..."

If you have any questions, please contact me at (312) 886-1999.

Sincerely,

Scott K. Hansen
Remedial Project Manager

cc: Dave Trainor, Newfields
Jamie Dunn, WDNR
Omprakash Patel, Weston Solutions, Inc.
Ervin Soulier, Bad River Band of the Lake Superior Chippewa
Melonee Montano, Red Cliffe Band of the Lake Superior Chippewa